



ES&H Section Policies for Sealed Neutron Source Use for Support of Fermilab Experiments

This policy addresses use of a sealed neutron source at locations on site other than the Radiation Physics Calibration Facility (RPCF). The following procedures for use of a sealed neutron source are in place to control radiation exposures.

1. Trained ES&H Section personnel shall complete R.P. Form # 8, ES&H Section Radioactive Source Use Log when retrieving and returning the neutron source to the neutron storage cave located at RPCF. The source shall be returned to RPCF each day. ES&H Section personnel shall ensure that RPCF personnel will be available to allow access to RPCF for the return of the neutron source. ES&H Section personnel shall make special arrangements with the Radiation Protection Group Instrumentation Team Leader if the neutron source will be returned after 5:00 pm.
2. Use of neutron sources must remain under ES&H Section control at all times. Properly trained ES&H Section personnel shall continuously supervise the neutron source during transport and use.
3. The ES&H Section Source Physicist or Back-Up shall approve authorized users of the neutron source. ES&H Section personnel shall ensure that only authorized users handle the neutron source.
4. The ES&H Section Source Physicist or Back-Up shall approve the specific location of neutron source use.
5. The only ^{252}Cf sealed neutron source authorized for use at locations other than the RPCF is 252-7.2-1. No $^{241}\text{AmBe}$ sealed neutron sources may be used at any location other than RPCF.
6. ES&H Section personnel and authorized users shall wear dosimetry badges when the neutron source is in use. The tissue dose equivalent rate for 252-7.2-1 is about 4 mrem/hr at one foot. Although this dose rate does not constitute a Radiation Area, dosimetry badges are required because of the increased uncertainties encountered in measuring neutron dose.
7. During use, the authorized users shall remain at least one foot (30 cm) away from the sealed neutron source.
8. When possible, a lead cap should be placed over the sealed neutron source during use to reduce gamma exposure. If the source is being used in a polyethylene sphere, this may not be feasible.

9. ES&H Section personnel shall ensure that "Caution Radioactive Materials" and "Controlled Area" signs are posted at each access point to the area where the neutron source is used.
10. The neutron source shall be placed in a polyethylene cylinder during transport and when not in use.
11. In the event that the source becomes damaged, call x 3131. Keep others from entering the area. ES&H Section personnel shall immediately notify their supervisor and/or an ES&H Section Associate Head.